

## REMARKS

Claims 1-17 are pending in the application. Claims 1 and 12 are currently amended. Applicant respectfully requests for allowance of all the pending claims based on following discussions.

### Rejections under 35 USC 103

#### Claims 1-2 and 4-14

Claims 1-2 and 4-14 are rejected under 35 U.S.C. 103(a) as obvious over U.S. Patent No. 6,309,532 to Tran et al. (hereinafter referred to as “Tran”), evidenced by U.S. Patent No. 6,071,484 to Dingman, Jr. et al. (hereinafter referred to as “Dingman”).

Independent claim 1 is directed to a method for the treatment of gaseous chemical waste which comprises the steps of: continuously circulating water through an essentially closed loop incorporating a gas scrubbing unit and an ion absorption unit comprising a water permeable ion absorbing means; feeding exhaust gas or a reaction product thereof to the gas scrubbing unit for dissolution in the circulating water thereby to form an aqueous solution containing ionic species derived from the exhaust gas; continuously bringing the circulating water into contact with the ion absorbing means in the ion absorption unit while applying an electrical potential across the thickness of the ion absorbing means and removing from the ion absorption unit a more concentrated aqueous solution of the ionic species; and continuously adding to the closed loop a quantity of water corresponding to the quantity of aqueous solution of the ionic species removed from the ion absorption unit, wherein the added water circulates through the ion absorption unit simultaneously when the electrical potential is applied to the ion absorbing means of the ion absorption unit for removing from the ion absorption unit the

more concentrated aqueous solution of the ionic species. It is noted that the underlined language is currently added to claim 1 by amendment.

Tran fails to teach “the added water circulates through the ion absorption unit simultaneously when the electrical potential is applied to the ion absorbing means of the ion absorption unit for removing from the ion absorption unit the more concentrated aqueous solution of the ionic species.” Tran teaches a system that deionizes an aqueous solution with cell 30, and stores the purified solution in product tank 160. *See, FIG. 5.* As cell 30 deionizes, contaminants accumulate in it, thereby reducing the effectiveness and efficiency of deionization. *See, col. 16, lines 23-27.* When the effectiveness and efficiency of deionization drop to a certain level, the deionization process is stop and a regeneration process is activated to clean up the contaminants accumulated in cell 30. *See, col. 16, lines 61-64.* For this purpose, power supply 117 is disconnected, reduced, or polarity reversed, and regeneration tank 170 is fluidly connected to pump 152 via recycle line 162. *See, col. 16 line 65 – col. 17 line 3.* As illustrated in FIG. 6, the deionization and regeneration are performed alternately, but never simultaneously. This clearly differs from the claimed invention.

Examiner point out that Tran with reference to FIG. 7 teaches a system 175 having two cells 30A and 30B, wherein when one of the cells operates in a purification mode, the other operates in a regeneration mode. *See, the Office Action, page 3, line 23 – page 4, line 9.* Examiner then asserts that Tran reads on the claimed invention because it teaches a system in which the liquid purification and regeneration are operated simultaneously, even though by different cells. *Id.*

Applicant respectfully disagrees with the assertion. The claimed invention teaches simultaneously applying electrical potential and adding water to the same ion absorption unit. Claim 1 reads "...the added water circulates through the ion absorption unit simultaneously when the electrical potential is applied to the ion absorbing means of the ion absorption unit for removing from the ion absorption unit the more concentrated aqueous solution of the ionic species." It is clear from the claim language that the ion absorbing means to which the electrical potential is applied is part of the ion absorption unit through which the add water circulates. However, in Tran, each cell 30A or 30B can only operate in either the purification mode or the regeneration mode at one time. This does not meet the claimed limitation.

Dingman does not cure the deficiency of Tran. It is noted that Dingman is cited for its teaching of a "*gas scrubbing unit*," but not for any disclosure of how to coordinate and manage the step of adding water to a chemical waste treatment system, and the step of removing ions from a solution to be treated. *See, Office Action of January 2, 2009, page 3.* There has been no statement or reason provided in the record establishing that Dingman does in fact teach the claim language "the added water circulates through the ion absorption unit simultaneously when the electrical potential is applied to the ion absorbing means of the ion absorption unit for removing from the ion absorption unit the more concentrated aqueous solution of the ionic species."

It would not have been obvious for a person skilled in the art to modify Tran by performing the deionization and regeneration simultaneously. During deionization, electrical potential is applied to cell 30A or 30B, thereby creating an electrical field between two adjacent electrodes for absorbing ions in the solution flowing through them.

Yet, regeneration is a process that forces the electrodes to release the absorbed ions. The two processes as applied in Tran are reverse in nature, and cannot be reasonably performed simultaneously.

As such, claim 1 is patentable over Tran in view of Dingman under 35 USC 103(a). Independent claim 12, as amended, includes limitation “wherein the added water circulates through the ion absorption unit simultaneously when the electrical potential is applied to the ion absorbing means of the ion absorption unit for removing from the ion absorption unit the concentrated aqueous solution of ionic species.” For reasons discussed above, claim 12 is patentable over Tran in view of Dingman under 35 USC 103(a). Accordingly, claims 2, 4-11, 13, and 14 that depend from independent claim 1 or 12 and include all the limitations recited therein are also patentable over the cited references under section 103.

### **Claims 3, 15, 16, and 17**

Claims 3, 15, 16, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tran in view of U.S. Patent No. 6,187,162 to Mir, U.S. Patent No. 5,045,291 to Keller, U.S. Patent No. 5,350,523 to Tomoi et al., U.S. Patent No. 4,795,565 to Yan, and U.S. Patent No. 4,141,828 to Okada et al.

As discussed above, independent claims 1 and 12 are patentable over the Tran and Dingman under section 103. Accordingly, claims 3, 15, 16, and 17 that depend from claim 1 or 12 and include all the limitations recited therein are patentable over the cited references under section 103, as well.

### **CONCLUSION**

Applicant has made an earnest attempt to place this application in an allowable form. In view of the foregoing remarks, it is respectfully submitted that the pending claims are drawn to a novel subject matter, patentably distinguishable over the prior art of record. Examiner is therefore, respectfully requested to reconsider and withdraw the outstanding rejections.

Should Examiner deem that any further clarification is desirable, Examiner is invited to telephone the undersigned at the below listed telephone number.

Applicant does not believe that any additional fee is due, but as a precaution, the Commissioner is hereby authorized to charge any additional, necessary fee to deposit account number 50-4244.

Respectfully submitted,

By: /Ting-Mao Chao, Reg. No. 60,126/  
Ting-Mao Chao  
Attorney for Applicant  
Registration No. 60,126

Edwards Vacuum, Inc.  
Legal Service – Intellectual Property  
2041 Mission College Blvd. Suite 260  
Santa Clara, CA 95054

TEL: 1-408-496-1177 ext. 2222  
FAX: 1-408-496-1188

**Customer No.: 71134**